# NEW STANDARD ACADEMY

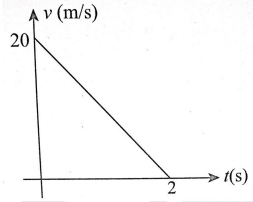
**Marks: 60**

**Date : 09-09-24** **CLASS : 11TH NEET** **Time: 3 HRS**

## PHYSICS

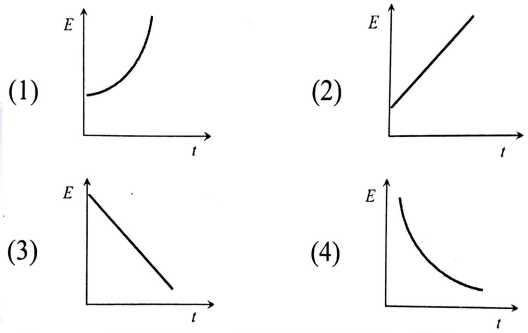
1. Given that the displacement of the body in metre is a function of time as follows $x=2t^4+5$
The mass of the body is 2 kg. What is the increase in its kinetic energy one second after the start of motion?
(1) 8J
(2) 16 J
(3) 32 J
(4) 64 J

2. Velocity-time graph of a particle of mass 2 kg moving in a straight line is as shown in figure. Work done by all the forces on the particle is




(1) 400 J
(2)-400 J
(3)-200 J
(4) 200 J

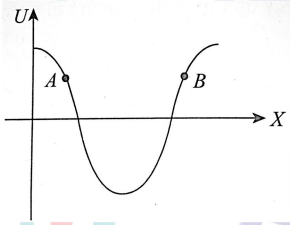
3. A particle is dropped from a height h. A constant horizontal velocity is given to the particle. Taking g to be constant every where, kinetic energy E of the particle wrt time is correctly shown in




4. A body is dropped from a certain height. When it lost an amount of PE 'U', it acquires a velocity 'u'. The mass of the body is
(1) $\frac{2U}{v^2}$ (2) $\frac{2v}{U^2}$
(3) $\frac{2v}{U}$ (4) $\frac{U^2}{2v}$

5. A pendulum has a length 'L' Its bob is pulled aside from its equilibrium position through an angle a and then released The speed of the bob when it passes through the equilibrium position is given by
(1) $\sqrt{2gl\cos\theta}$
(2) $\sqrt{2gl\sin\theta}$
(3) $\sqrt{2g/(1-\cos\alpha)}$
(4) $\sqrt{2g/(1-\sin\theta)}$

6. Potential energy v/s displacement curve for one dimensional conservative field is shown. Force at A and B is respectively




(1) Positive, Positive
(2) Positive, Negative
(3) Negative, Positive
(4) Negative, Negative

7. A block of mass M is allowed to slide down a fixed smooth inclined plane of angle $\theta$ and length (l) . What is the power Delivered by the force of gravity when the block reaches bottom?
(1) $\sqrt{2m^2\iota(gsin\theta)^3}$
(2) $(2/3)m^3\iota g^2\sin\theta$
(3) $\sqrt{\left(\frac{2}{3}\right)m3t^2g\,Cos\,\theta}$
(4) $(1/3)m^3\iota g^2\sin\theta$

8. Power applied to a particle varies with time as $P=(3t^2 - 2t + 1)$ W, Where t is in second. Find the change in its kinetic energy between time t = 2 s and t = 4 s
(1) 32 J (2) 46 J
(3) 61 J (4) 102 J

9. From a waterfall, water is falling down at the rate of 100 kg/s on the blades of turbine. If the height of the fall is 100 m,

then the power delivered to the turbine is approximately equal to

(1) 100 kW (2) 10 kW
(3) 1 kW (4) 1000 Kw

10. A body of mass m is projected at an angle 9 to the horizontal with initial velocity u. The mean power developed by the gravity over the time of flight is

(1) mgu sin$\theta$ (2) mgu cos $\theta$
(3) mg(gt-u) (4) zero

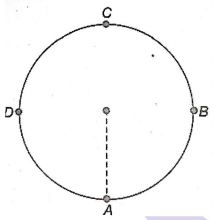
11. A body crosses the topmost point of a vertical circle with critical speed. What will be its net acceleration when the string is horizontal?

(1) g (2) 2g
(3) 3g (4) 10g

12. A body is moving in a vertical circle of radius such that the string is just taut at its highest point. The speed of the particle when the string is horizontal is

(1) $\sqrt{gr}$ (2) $\sqrt{2gR}$
(3) $\sqrt{3gr}$ (4) $\sqrt{4gR}$

13. A stone is attached to one end of a string and rotated in a vertical circle If string breaks at the position of maximum tension, it will break at




(1) A (2) B
(3) C (4) D

14. A bomb initially at rest explodes by it self into three equal mass fragments. The velocities of two fragments are $(3\hat{\imath}+2\hat{\jmath})$m/s and $(-\hat{\imath}-4\hat{\jmath})$ m / s The velocity of the third fragment is (in m / s )

(1) $2\hat{\imath}+2\hat{\jmath}$ (2) $2\hat{\imath}-2\hat{\jmath}$
(3) $-2\hat{\imath}+2\hat{\jmath}$ (4) $-2\hat{\imath}-2\hat{\jmath}$

15. A monkey of mass 20 kg rides on a 40 kg trolley moving with constant speed of 8 m/s along a horizontal track. If the monkey jumps vertically to grab the overhanging branch of a tree, the speed of the trolley after the monkey has jumped off is

(1) 8 m/s (2) 1 m/s
(3) 4 m/s (4) 12 m/s

## CHEMISTRY

1. The $pk_a$ of a weak acid (HA) is 4.5. The pOH of an aqueous buffer solution of HA in which 50% of the acid is ionized is

(1) 7.0 (2) 4.5
(3) 2.5 (4) 9.5

2. In an aqueous solution the ionisation constants for carbonic acid are $K_1 = 4.2 \times 10^{-7}$ and $K_2 = 4.8 \times 10^{-11}$
Select the correct statement for a saturated 0.034M solu- tion of carbonic acid
(1) The concentration of W is double that of cot.
(2) The concentration of $CO_3^{2-}$ is 0.034 M
(3) The concentration of $CO_3^{2-}$ is greater than that of $HCO_3^-$
(4) The concentration of $H^+$ and $HCO_3^-$ are approximately equal

3. At a certain temperature, 1.0 moles of $PCl_{3(g)}$ and 2.0 moles of $Cl_{2(g)}$ were placed in a 3.0 litre container. When equilibrium reached, only 0.70 mole of $PCI_3$ remained unreacted. Calculate the value of Kc for the reaction $PC1_{3(g)}+Cl_{2(g)} \rightleftharpoons PCl_{5(g)}$
(1) 0.76
(2) 0.076
(3) 0.38
(4) 1.52

4. $N_2$ and $H_2$ in 1:3 molar ratio are heated in a closed container having a catalyst. When the following equilibrium $N_{2\,(g)}+3H_{2\,(g)} \rightleftharpoons 2NH_{3(g)}$ is attained, the total pressure is 10 atm and mole fraction of $NH_3$ is 0.60. The equilibrium constant Kp for dissociation of $NH_3$ is
(1) $1.333atm^{-2}$
(2) $0.75atm^2$
(3) $0.75atm^{-2}$
(4) $1.333atm^2$

5. 4 moles of A are mixed' with 4 moles of B, when 2 moles of C and D are formed at equilibrium according to the reaction, $A+B \rightleftharpoons C+D$ the value of equilibrium constant is
(1) 4
(2) 1
(3) 1/2
(4) ¼

6. 1.1 mol of A is mixed with 2.2 mol of B and the mixture is kept in one litre flask till the equilibrium is reached. At equilibrium, 0.2 mol of C is formed. If the equilibrium

reaction is A+2B ⇌ 2C + D the value of equilibrium constant is
(1) 0.002
(2) 0.004
(3) 0.001
(4) 0.003

7. The pH of a solution is 6. Sufficient amount of acid is added to decrease the pH to 2. The increase in hydrogen ion concentration is
(1) three times
(2) hundred times
(3) thousand times
(4) ten thousand times

8. At 298 K, the pH of 0.23 M weak acid HX (ionization constant =7.3 x $10^{-6}$) would be
(1) 11.47
(2) 2.88
(3) 3.88
(4) 4.88

9. The pH of a solution is 5.0. To this solution sufficient acid is added to decrease the pH to 2. The increase in hydrogen ion concentration would be
(1) 6 times
(2) 90 times
(3) 100 times
(4) 1000 times

10. The pH of 0.004 M hydrazine solution is 9.7. Its ionisation constant (K) is
(1) $7.79 \times 10^{-8}$
(2) $4.49 \times 10^{-9}$
(3) $1.67 \times 10^{-10}$
(4) $6.25 \times 10^{-7}$

11. The pH of solution formed on mixing 0.2 M $NH_4CI$ and 0.1 M $NH_3$ ( $PK_b$ of ammonia is 4.75)
(1) 9.95
(2) 9.25
(3) 8.95
(4) 7.25

12. The ionization constant of an acid-base indicator (a weak acid) is $1.0 \times 10^{-6}$ The ionized form of the indicator is red whereas the unionized form is blue. The pH change required to alter the colour of the indicator from 80% blue to 80% red is
(1) 2.00
(2) 1.40
(3) 1.20
(4) 0.80

13. Lemon, orange and tamarind paste contain respectively
(1) citric acid, ascorbic acid and tartaric acid
(2) ascorbic acid, tartaric acid and citric acid
(3) tartaric acid, citric acid and ascorbic acid
(4) tartaric acid-ascorbic acid, and citric acid.

14. The compound whose 0.1 M solution is basic is
(1) ammonium acetate
(2) ammonium chloride
(3) ammonium sulphate
(4) sodium acetate

15. How many ml of 1M $H_2SO_4$ is required to neutralise 10 ml of 1 M NaOH solution?
(1) 2.5
(2) 5.0
(3) 10.0
(4) 20.0

## BIOLOGY

1. Glycolysis was discovered by –
(a) Embden
(b) Meyerhof
(c) Parnas
(d) All

2. Glycolysis -
(a) Takes place in all living cells
(b) Causes partial oxidation of glucose (one molecule) to form 2 molecules of pyruvic acid and 2 ATP as net gain
(c) Uses 2 ATP at two steps
(d) All

3. Which one is false for glycolysis?
(a) Substrate level phosphorylation occurs
(b) The end products are $CO_2$ and $H_2O$
(c) ATP is formed
(d) ATP is used

4. The oxidation of pyruvic acid to $CO_2$ is called -
(a) Fermentation
(b) TCA/Citric acid cycle
(c) ETS
(c) Glycolysis
(d) Oxidative phosphorylation

5. In alcoholic fermentation, NAD is produced during the -
(a) Reduction of acetyldehyde to ethanoi
(b) Oxidation of glucose
(c) Oxidation of pyruvate to acetyl CoA

(d) Hydrolysis of ATP to ADP

6. In animal cells, like muscle, during exercise, when $O_2$ is inadequate for cellular respiration, pyruvic acids is reduced into lactic acid by
   (a) $0_2$
   (b) Carboxylation
   (c) lactate dehydrogenase
   (d) All
7. Pyruvate → $C_2H_5OH + CO_2$

   The above reaction needs 2 enzymes named as -
   (a) Pyruvate decarboxylase and alcohol dehydrogenase
   (b) Pyruvate decarboxylase and enolase
   (c) Pyruvate decarboxylase and pyruvate kinase
   (d) Pyruvate carboxylase + Aldolase
8. Where is ATP synthesized in glycolysis?
   (a) When 1, 3 di PGA is changed into 3 PGA
   (b) When PEPA is changed into pyruvic acid
   (c) When Fr. 1, 6 di P is broken in Triose phosphate (2 molecules)
   (d) Both a and b
9. In Kreb's cycle, the first product is citric acid which is a 6-carbon compound It is formed by a condensing irreversible 1 reaction between -
   (a) OAA and Pyruvic acid
   (b) OAA and Acetyl Coenzyme A
   (c) Pyruvic acid and Acetyl Coenzyme A
   (d) OAA and Citrate synthetase
10. In Kreb's cycle, how many oxidation (dehydrogenation) occur?
    (a) 4
    (b) 6
    (c) 2
    (d) 1
11. In Kreb's cycle -
    (a) acetyl Coenzyme A undergoes 4 oxidations and 2 decarboxylations
    (b) Pyruvic acid undergoes 4 oxidations and 2 decarboxylations
    (c) TCA undergoes 4 oxidations and 4 decarboxylations
    (d) OAA undergoes 4 oxidations and 2 decarboxylations
12. Fermentation is incomplete breakdown of carbohydrates. It is performed by -
    (a) All microbes
    (b) Some fungi and some bacteria
    (c) All fungi and bacteria
    (d) Only yeast
13. Correct sequence of events in Kreb's cycie is -
    (a) Acetyl CoA → Citrate → Pyruvate – $\alpha$-ketoglutarate → Succinate → Malate → Fumarate → OAA
    (b) Acetyl CoA → Citric acida- $\alpha$ ketoglutaric acid →Succinic acid→ Fumaric acid→ Malic acid → OAA
    (c) Acetyl CoA → Citric acid →Malic acida→$\alpha$-ketoglutaric acid→ Succinic acid→OAA
    (d) All are wrong
14. Fermentation takes palce :
    (a) Under anaerobic conditions in many prokaryotes and unicellular eukaryotes
    (b) Under aerobic conditions in many prokaryotes and unicellular eukaryotes
    (c) Under anaerobic conditions in all prokaryotes and unicellular eukaryotes
    (d) Under aerobic conditions in all prokaryotes and unicellular eukaryotes
15. If $O_2$ is not present, yeast cells break down glucose to –
    (a) $CO_2 + H2O$
    (b) $CO_2$ + Lactic acid
    (c) $CO_2$ + Pyruvic acid
    (d) $C_2H_5OH$ and $CO_2$